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ABSTRACT

Texas Hill Country is a land of fresh water springs, stony hills, and steep canyons and home to many rare plants and animals. Six activities for grades 3-5 and six activities for grades 6-12 are contained in this guide. Elementary activity highlights include using "The Lorax" by Dr. Seuss to stimulate critical thinking about environmental problems and endangered species. Highlights for middle and high school student activities include student-led research of suggested topics concerning conservation of rare resources in Hill Country. Each activity contains some or all of the following: background information, questions, objectives, materials, procedures, and evaluations where appropriate for the teacher. Contains student worksheets and teacher pages. (SJR)

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TEXAS PARKS AND WILDLIFE

ED 427 963

Rare Plants & Animals *of the*

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Educator's Guide

Prepared by
Endangered Resources Branch

SE0602358

Rare Plants and Animals of the Texas Hill Country
Summary of Activities for Educators and Their Students

Elementary - Grades 3-5

*Hill Country Treasures - A wordfind and descriptive narrative about the unique natural resources of the Texas Hill Country.
Reading, Vocabulary

*TAAS Reading Narratives on Rare Texas Wildlife - Reading narratives on the Bald Eagle and the Texas Blind Salamander designed to help students prepare for the reading portion of the TAAS test.
Reading comprehension

*Endangered Wildlife Education Campaign - An art activity where students make a poster to inform people about a rare plant or animal. Two levels of this activity are presented, one for grades 3-5, and one for grades 6-8.
Art, Creative expression

*Tobusch Fishhook Cactus - Where Are You? A math activity where students learn how biologists monitor the number of individuals in a population of rare cactus plants over several years. Two levels of this activity are presented, one for grades 3-5, and one for grades 6-8.
Estimation

Environmental Barometer - An activity from Project WILD where students observe and count wildlife in an area, discuss why the wildlife is or is not present, and consider ways in which the presence of wildlife can be seen as an indicator of environmental quality.
Analysis, Classification, Comparing similarities and differences, Computation, Discussion, and Synthesis

Exploring the Lorax - From the Rare and Wild Texas series of activities presented to teachers at TPWD's teacher workshops, this activity is based on the book *The Lorax* by Dr. Seuss. Students are asked questions about the story to stimulate critical thinking about environmental problems and endangered species. The activity can be geared for different age groups depending on the complexity of the questioning.
Analyzing, Interpreting, Critical thinking skills

Middle and High School - Grades 6-12

*What Would You Do? - Based on Project WILD's Ethi-Reasoning, this activity presents a dilemma to students about rare resource conservation, asking them to analyze the situation and make a decision about what they would do. Students work in groups, potential for lively discussions.
Reading, Working in teams, Critical thinking

* The Texas Hill Country - Creations in Art
  *Students do background research and then design a mural for their classroom depicting the life history and habitats of the Hill Country's rare and unique plants and animals.
  *Each student designs a diorama depicting some aspect of the rare and unique natural resources found in the Texas Hill Country.
Compiling and analyzing information, Art, Creative expression

*The Rare Scare - From the Rare and Wild Texas series of activities developed for teacher workshops, this activity helps students learn about the reasons animals become rare. Students are asked to look at drawings of imaginary animals, propose a reason for endangerment, and develop a plan to recover the species. *Analyzing, Interpreting, Critical Thinking, Creative Expression*

*Using Topographic Maps to Study Wildlife - Students use a topographic map to delineate landscape features and likely habitat for the Golden-cheeked Warbler. An extension of this activity for grades 9-12 helps students understand how topographic maps are used in field studies. Students use math and map skills to complete a mapping exercise using a topographic map and realistic field data on Golden-cheeked Warblers.
Map skills, Determining slope, Compiling and analyzing information, and Presenting data

*Comparing Plant Diversity - A field exercise where students determine the number of various kinds of plants growing on two different areas. Students learn about biodiversity, specifically plant diversity, and practice methods used by scientists to determine various aspects of plant diversity.
Collecting, compiling, analyzing, and presenting data, Using the scientific method to carry out an experiment and draw conclusions

*Exploring Conservation of Rare Species in the Hill Country - A Research Project - Students conduct their own research of suggested topics concerning conservation of rare resources in the Hill Country. They present the results of their investigations in a report format. Students also make an oral presentation to the class concerning the highlights of their work. Students work in teams or individually.
Compiling and analyzing information, Report writing, Oral presentation

Rare Plants & Animals
of the
Hill Country

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Hill Country Treasures

The Texas **HILL COUNTRY**, or **EDWARDS PLATEAU**, is a land of fresh water **SPRINGS**, stony hills, and steep **CANYONS**. The region is home to many rare plants and animals found nowhere else on earth.

The average yearly rainfall ranges from 15 to 34 inches. Most of the rain falls in May or June and September. **SOILS** of the Edwards Plateau are usually shallow with **LIMESTONE** rock underneath. Elevations range from about 100 feet to over 3,000 feet above sea level.

The limestone of the Edward's Plateau is **HONEYCOMBED** with thousands of **CAVES**. Some of them are home to strange **INSECTS** without eyes, that spend their whole life in the **DARKNESS** of the caves. Beneath the eastern edge of the Plateau lies a hidden world of **UNDERGROUND** lakes known as the Edwards **AQUIFER**. This precious water resource also is home to a number of curious creatures, such as the Texas **BLIND SALAMANDER**, an aquatic salamander that lives underground in the aquifer. The cool, clean water flowing from Hill Country springs provides habitat for other rare species like the **SAN MARCOS SALAMANDER**, **FOUNTAIN DARTER** (a small fish), and Texas **WILD-RICE**.

The endangered **GOLDEN-CHEEKED WARBLER** is a colorful **SONGBIRD** that nests in the juniper-oak **WOODLANDS** of central Texas. These birds use the peeling bark of large, old **JUNIPER** (sometimes called cedar) trees to build their nest. Habitat for the Golden-cheeked Warbler has been lost as cities such as **AUSTIN** and **SAN ANTONIO** have expanded into the woodlands.

Another endangered songbird, the **BLACK-CAPPED VIREO**, nests on open **RANGELANDS** with scattered low brushy plants. The vireos build a nest about 3 feet above the ground. Too many **DEER** and livestock create problems for the vireo because the low-growing woody cover needed to hide the nest is removed by **OVERGRAZING**. Both songbirds nest in Texas and **MIGRATE** to **MEXICO** and Central America to spend the winter.

Today, the Texas Hill Country consists of grasslands, juniper/oak woodlands, and live oak **SAVANNAH** (an open grassland with scattered trees and shrubs). People in rural areas of the Hill Country earn a living by managing their land for **LIVESTOCK** and **WILDLIFE**.

WORDFIND

Directions: Read the story to learn about the Texas Hill Country. The words in black capital letters are hidden in the wordfind. Can you find them? Good Luck!

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                  O W F S
                  C H C P
                  L R P X
                  J I F J
                  Q Z M D
                  N E U E
                  L I V E S T O C K L H H
                  L D T R B T B Q L W F B D R R
                  Y G D S F S O N G B I R D M E Y Z
                  M I F D U S D N U O R G R E D N U Q Q
                  R E L B R A W D E K E E H C N E D L O G R
                  L X S F F O E R I V D E P P A C K C A L B I
                  R E T R A D N I A T N U O F M E S R K H Z F
                  V G N Y E T A R G I M C Y N A A D P Y I A Z
B U I Z W B R A P S Z J U N I P E R A N G E L A N D S E D T
  H O N E Y C O M B E D W A R D S P L A T E A U A F H R G C
    L C S G N I R P S S E N K R A D A O F F S O L C S J U E
      Z I E H O V E R G R A Z I N G S B Z Q D P D K V K F
        W X C G T X R E F I U Q A S S W C A N Y O N S I
          U E T B C U A X Y R T N U O C L L I H O M L
            R M S     H D K R T E C I R D L I W D
              W       G F H O K R G L S B J L
                    H A N N A V A S R I
                  L I L M G S C W
                    O P N L O L
                      E A A K
                      M S S K
                      B F Q W
                        V G
                        D Q
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Teacher's Page

WORDFIND

Rare Plants & Animals of the Hill Country

Suggested for grades 3 -5

TOBUSCH FISHHOOK CACTUS - WHERE ARE YOU?

A Math Activity

Tobusch Fishhook Cactus is an endangered plant that grows in the Hill Country of central Texas. It is a small cactus with a central spine shaped like a small fishhook.

Biologists have a hard time finding this cactus because it is so small and because its coloring blends in with the surrounding grasses. The best time to find the cactus is in February, when many of the plants bloom with yellow flowers.

Biologists study populations or groups of cactus plants to find out if they are increasing or decreasing in number and why. As a biologist, your job is to monitor a population of tobusch fishhook cactus on a wildlife management area. You will also be looking for a small beetle that lays its eggs in the cactus. When the eggs hatch, the larvae eat the cactus. Scientists need to learn more about this beetle and its affect on the cactus.

Over the past three years, you have been studying a plot of land where these cactus grow. The plot is 10 ft. long and 10 ft. wide. To record your observations, you have drawn a picture of the plot during the spring of 1995, 1996, and 1997. The drawings show where cactus plants were growing each year. Study the drawings on the next page and answer the questions below.

Questions:

1. What is the total number of cactus plants in the population in 1995?

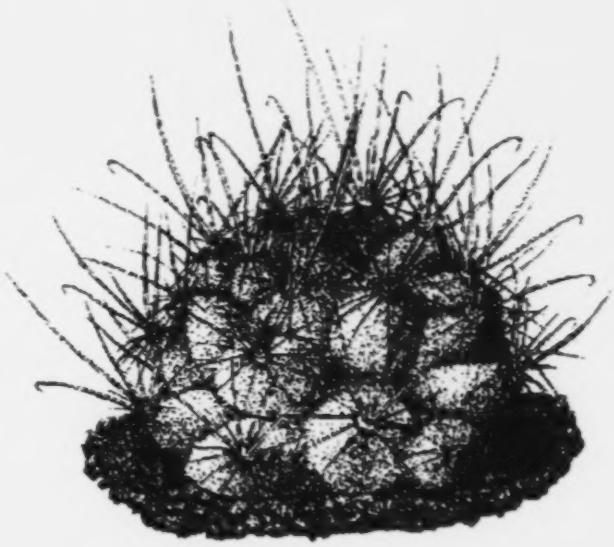
2. What is the total number of cactus plants in the population in 1997?

3. How many cactus plants died in 1997?

4. How many new plants (the baby cactus plants are smaller) started growing in 1996?

5. Over the three years, how many plants died and how many new plants started growing in the plot?

6. Do you think this population of tobusch fishhook cactus is doing OK? Why?



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Suggested for grades 5 - 8

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A Math Activity

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Questions:

1. What is the total number of cactus plants in the population in 1995? In 1997? Has the total cactus population increased or decreased from 1995 to 1997?

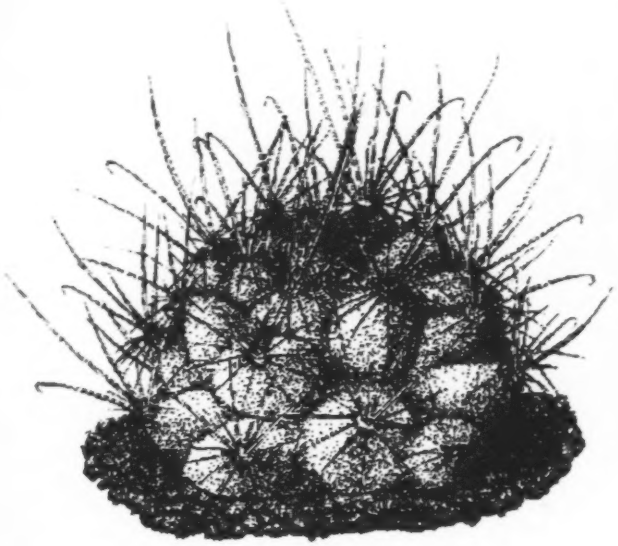
2. How many cactus plants died (mortality) during the 3 years?

3. What percent of the cacti died (percent mortality) during 1997?

4. How many new cactus plants became established (recruitment) from 1995 to 1997?

5. What is the ratio of mortality to recruitment over the 3 year period? What could you say about the population of plants if the ratio is greater than 1? What if the ratio is less than 1?

6. Which year had the highest recruitment? Which year had the highest mortality?



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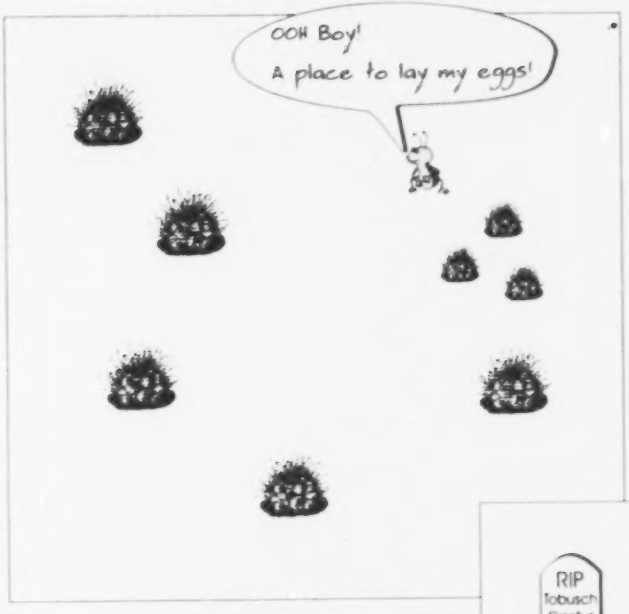
Recording Changes Through Time
Tobusch Fishook Cactus

1995



1996

1997

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Suggested for Grades 3 - 8

ENDANGERED WILDLIFE EDUCATION CAMPAIGN

OBJECTIVES
Students will be able to: 1) learn about the life history and habitat requirements of endangered and threatened species occurring in central Texas, 2) understand the reasons for decline of these species and what people are doing to help them, and 3) express their new knowledge and creative ideas by producing an informational poster.

SUBJECT AREAS
Science, Art, Language Arts

METHOD
Students research the species of their choice from the list of endangered and threatened animals and plants occurring in central Texas. They create a poster illustrating the species and providing information about its habitat, reasons for decline, and what people are doing to enhance its survival.

BACKGROUND AND PROCEDURES
Distribute the student pages to the class. There is a student page for grades 3-5 and one for grades 6-8. Go over the student page with the class and ask the students to choose a plant or animal from the list. Students may work individually or in groups, depending on the amount of time designated for the activity. Allow time (about 1/3 of the allotted class time) for the students to research the species they choose. There are a variety of materials included in this packet that students can use to learn about the rare species they choose. You may also provide books and magazines, or let students use the internet to research their plants and animals. The Texas Parks and Wildlife Department home page has a variety of information about each of the species listed (www.tpwd.state.tx.us). Once the students have completed their research, have them design a poster to inform others about their rare species. Have the students discuss their posters with the rest of the class.

MATERIALS
- background information and photos of each species
- art supplies (poster board, crayons, markers, paints, chalk, colored paper, etc.)

EVALUATION
Have the students write a short essay about the most important things they learned concerning the rare species they studied. Encourage them to write something about the plant or animal's biology, habitat requirements, threats to its continued survival, interesting facts, and what people are doing to help.

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Suggested for grades 3-5

Endangered Wildlife Education Campaign

To help your classmates understand more about endangered species that occur in Texas, make a poster to display at school. Your poster should help kids learn about the species, where it lives, why it is endangered, and what people can do to help. Choose one animal or plant from the list below. Be creative and have fun!

Golden-cheeked Warbler
Black-capped Vireo
Tobusch Fishhook Cactus
Texas Snowbells
Texas Wild-rice
Texas Blind Salamander
San Marcos Salamander
Fountain Darter
Tooth Cave Ground Beetle

After you have completed your poster, show it to the rest of the class and talk about ways people can help conserve your plant or animal.

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Suggested for grades 6-8

Endangered Wildlife Education Campaign

Situation: You are an advertising executive and you have been hired to develop an education campaign to inform Texans about endangered wildlife that occurs in the Hill Country of central Texas. Your client would like you to develop an advertising campaign for one of the following species:

Golden-cheeked Warbler
Black-capped Vireo
Tobusch Fishhook Cactus
Texas Snowbells
Texas Wild-rice
Texas Blind Salamander
San Marcos Salamander
Fountain Darter
Tooth Cave Ground Beetle

You have decided to design an informative poster for use by educators, public officials, park managers, zoos, nature centers, and other education facilities. The poster will be also be displayed in public places such as malls and government buildings. You and your client have agreed that the poster should be interesting, eye-catching and artistically attractive. It should also be designed to provide information about the animal=s biology, identify problems and threats associated with its continued existence, describe what is being done to protect the animal, and offer suggestions/solutions about what people can do to help with the conservation efforts. After you have completed your poster, show it to the rest of the class and discuss the important points you would like them to understand about your species. Be creative and have fun!

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Suggested for Grade 4 - TAAS Reading Comprehension

TEXAS BLIND SALAMANDER

The Texas blind salamander is an unusual and interesting animal. The only place in the world this endangered animal occurs is in Hays County near the town of San Marcos in central Texas.

Unusual Features

The Texas blind salamander is an amphibian. Amphibians need water to lay eggs and produce young. Unlike some amphibians, frogs and toads for example, the Texas blind salamander lives only in the water. Because it is adapted for living in water underground, it has no eyes, only two small black dots under the skin. It has little skin pigment, is white in color, and has red external gills used to get oxygen from the water. Only about five inches long, this salamander moves around on toothpick-like legs.

Habitat

The Texas blind salamander lives in water-filled caves of the Edwards Aquifer near San Marcos, Texas. The Edwards Aquifer is a large underground lake that provides drinking water for people and habitat for animals in central Texas. The Texas blind salamander depends on cool, clean water that stays at a constant temperature. Pollution and overuse of water caused by the growth of cities are problems that can affect the survival of this species. People can help by conserving water and preventing water pollution.

Feeding Behavior

The Texas blind salamander is an active predator. It feeds on a variety of small aquatic animals that live in the water-filled caverns, such as tiny snails and shrimp. When feeding, the salamander searches the bottom by moving its head from side to side. When it detects something living, its mouth quickly opens and the tiny food item is sucked into the mouth. The salamander has numerous sharp teeth to prevent the prey from escaping. Scientists believe these salamanders find their prey by sensing small vibrations in the water.

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TEXAS BLIND SALAMANDER

Select the best answer

Fact and Non-fact

1. Which of these is a FACT from the passage?
   - A. Texas blind salamanders live on land near water.
   - B. Texas blind salamanders have lungs and breathe air.
   - C. Texas blind salamanders have external gills used to get oxygen from the water.
   - D. Texas blind salamanders have large, black eyes.

Facts and Details

2. Texas blind salamanders grow to a length of _____.
   - A. 10 inches
   - B. 5 inches
   - C. 2 inches
   - D. 1.5 feet

Setting

3. If you could observe a Texas blind salamander in its habitat, you would be _____.
   - A. in the swamps of Louisiana
   - B. in the rainforest of Brazil
   - C. in southern Arizona
   - D. in central Texas

Cause and Effect

4. Texas blind salamanders are white in color because _____.
   - A. it helps them blend in with their surroundings
   - B. they are adapted to live underground where it is always dark
   - C. they like to match the tiny white shrimp they hunt
   - D. living in water makes them white

Facts and Details

5. Texas blind salamanders live in water-filled caves of _____.
   - A. the Edwards Aquifer
   - B. the Colorado River
   - C. Lake Travis
   - D. Caddo Lake

Word Definitions

6. In this passage, amphibian means _____.
   - A. a type of snake
   - B. an animal that eats plants
   - C. an flying insect
   - D. an animal that needs water to produce young

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Suggested for Grades 4-5 - TAAS Reading Comprehension

BALD EAGLES

Our National Symbol, the bald eagle is one of nature's most impressive birds of prey. The bald eagle occurs throughout the United States, Canada, and northern Mexico. Once an endangered species, the bald eagle has increased in number and is now listed as a threatened species by the U.S. Fish and Wildlife Service.

Unique Features

The bald eagle is a large bird. Males usually measure 3 feet from head to tail and weigh 7 to 10 pounds. They have a wingspan of 6 to 7 feet. Females are even larger, some reaching 14 pounds with a wingspan of 8 feet. Adults have a white head, neck, and tail, but first year birds are mostly dark. The bald eagle's large yellow bill is curved at the tip and built for tearing meat. The eagle's feet are equipped with sharp talons or claws used to capture and hold prey.

Habitat

Bald eagles nest mostly in the eastern half of Texas. They build their nests in large, tall trees located within 1 to 2 miles of large bodies of water, such as lakes, reservoirs, rivers, or the coast. Nests are often built in the tallest trees in an area, providing an easy flight path to and from the nest. Nests are found in a variety of trees, including cypress, water oak, live oak, elm, cottonwood, sycamore, and pecan. Open water or wetland areas located near nesting habitat is needed to provide feeding areas.

Migration

Bald eagles in Texas are divided into two groups: 1) eagles that nest in the eastern half of Texas, and 2) eagles that nest in northern states and then migrate to Texas to spend the winter months. Wintering birds may occur anywhere in the state, but they are mostly found near large lakes and reservoirs, such as Lake Buchanan.

Biology and Reproduction

Bald eagles build large stick nests lined with soft materials such as grass, leaves, and spanish moss. Nests are used for several years by the same pair of eagles, with the birds adding materials each year. Nests are often very large, measuring 6 feet across and weighing hundreds of pounds. Bald eagles usually lay two eggs in December. Young eagles can fly in 11 to 12 weeks, but the parents continue to feed them for 4 to 6 more weeks while they learn to hunt. Too much human activity and noise during the nesting season can cause eagles to abandon their nest, leaving the eggs and young unprotected. It is important to keep a safe distance away from nests during the nesting season.

Bald eagles eat mostly fish, but they also eat ducks and other birds, small mammals, and turtles. Carrion (dead animals) is eaten when it is available. Bald eagles capture fish by extending their talons a few inches below the water's surface. So they only catch live fish that are near the surface of the water or in shallows.

A Wildlife Conservation Success Story

Serious decline in the numbers of bald eagles began with the introduction of the pesticide DDT in 1947. Birds of prey at the top of the food chain, such as eagles, ate prey contaminated with this pesticide. Eagles contaminated with DDT did not lay eggs or produced thin eggshells that broke during incubation, the period of time when the young are developing inside the egg. In 1972, it became against the law to sell or use DDT in the United States, and a slow recovery for the bald eagle began. Today, the numbers of bald eagles successfully producing young continues to increase.

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Suggested for Grades 4-5

A Wildlife Conservation Success Story

Select the best answer

Fact and Non-fact

1. Which of these is a FACT from the passage?
   - A. bald eagles eat mostly rabbits
   - B. bald eagles are an endangered species
   - C. bald eagles build large stick nests
   - D. bald eagles do not occur in Canada

Facts and Details

2. Female bald eagles can have a wingspan of _____.
   - A. 5 feet
   - B. 3 yards
   - C. 4 feet
   - D. 8 feet

Setting

3. If you were observing a bald eagle nest, you would likely be _____.
   - A. in the Texas Panhandle
   - B. somewhere in the eastern half of Texas
   - C. in the desert
   - D. in the mountains of far west Texas

Cause and Effect

4. bald eagles have sharp talons because _____.
   - A. they use them to comb their feathers
   - B. they are useful in gripping tree limbs
   - C. they use them to capture and hold prey
   - D they are used to attack people when they get too close to the nest

Facts and Details

5. How many eggs do bald eagles usually lay?
   - A. 2 eggs
   - B. 3 eggs
   - C. 4 eggs
   - D. 6 eggs

Specialized Terms

6. In the passage, the word incubation means _____.
   - A. soaring in the sky
   - B. the period of time when the young are developing inside the egg
   - C. a disease that affects bald eagles
   - D. the period of time after the young hatch and before they are hunting on their own

Rare Plants & Animals
of the
Hill Country

Prepared by
Endangered Resources Branch
TEXAS PARKS AND WILDLIFE

PWD BK W7000-335 (3/98)

Main Idea

7. What is the main idea of the section, "Habitat?"
   - A. bald eagles nest in the eastern half of Texas near large bodies of water
   - B. bald eagles build their nests in cypress, live oaks, elms, and other trees
   - C. bald eagles need wetlands nearby
   - D. bald eagles eat mostly fish

Cause and Effect

8. Bald eagles often choose the tallest trees for nesting because _____.
   - A. they like to have a good look at surrounding land
   - B. they like to get wet when it rains
   - C. they prefer to have a clear flight path in and out of the nest
   - D. they build their nests in the tallest trees to keep it away from predators

Facts and Details

9. The main reason the numbers of eagles decreased during the 1950's and 1960's was _____.
   - A. contamination of the food chain with the pesticide DDT
   - B. people shot eagles for sport
   - C. people cut down too many nest trees
   - D. there was not enough fish to feed the eagles

Cause and Effect

10. Bald eagles are no longer listed as an endangered species because _____.
   - A. their numbers have increased, so they are no longer in danger of extinction
   - B. it is against the law to list animals as endangered
   - C. it is against the law to shoot bald eagles
   - D. bald eagles are now extinct

Facts and Details

11. A large reservoir in central Texas where lots of bald eagles spend the winter is called _____.
   - A. Caddo Lake
   - B. Amistad Reservoir
   - C. Lake Buchanan
   - D. Falcon Reservoir

Specialized Terms

12. In the passage, the word carrion means _____.
   - A. flight feathers
   - B. flesh of dead animals
   - C. to care for the young
   - D. a part of the wing

Suggested for Grades 5-12

WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE

(Adapted from Project WILD's Ethi-Reasoning)

OBJECTIVES

Students will be able to: 1) examine their own values and beliefs related to rare wildlife, 2) listen to and respect the rights of others to maintain different values and beliefs, and 3) evaluate possible actions they might take that have impact on wildlife and their habitats.

METHOD

Students read, discuss, make judgments and write about hypothetical dilemmas concerning rare wildlife and/or their habitats.

BACKGROUND

This activity is designed to give students the opportunity to examine their own values and beliefs as they relate to wildlife, especially endangered and protected species, and their habitats in Texas. It is not the intent of this activity to prescribe "right" and "wrong" answers for the students. One exception is in the areas where information about laws is conveyed.

State wildlife agencies are responsible for establishing laws and regulations to protect the wildlife resources of each state. For example, it is legal to hunt and fish for some animals in Texas; however, what animals and under what conditions are specified by laws and regulations for which Texas Parks and Wildlife Department is responsible. There are also federal regulations affecting wildlife. The U.S. Fish and Wildlife Service administers federal laws that protect birds of prey, songbirds, and endangered species. For example, federal law protects all birds of prey (eagles, hawks, owls) from shooting or any other intentional cause of death, injury, or harassment. All threatened and endangered species are protected by both federal and state laws. Songbirds are also protected by law; that is, it is against the law to intentionally harm or possess songbirds. It is also generally illegal to possess birds' nests, eggs and feathers, even those found lying on the ground. It is generally against the law to pick up a carcass of an animal which has been killed by a vehicle along the highway or road. Instead, local wildlife authorities should be notified. In many cases, it is against the law to take an injured wild animal home to care for it. For example, birds of prey cannot be cared for by private citizens unless those citizens have a permit to do so. There are many laws concerning wildlife. Your local game warden or Texas Parks and Wildlife Department biologist can provide information about laws protecting and affecting wildlife in your area.

Whether right or wrong, questions of law can be separated from questions of ethics. At a personal level, an individual's choices as to what seem right or wrong for him or her in terms of values and behaviors may be described as a personal code of ethics. Hunting, for example, is controversial for some people from an ethical point of view. Some people say that even though hunting is legal, it is unethical, because a human being is taking the life of a wild animal. Others believe hunting is a responsible and ethical form of recreation, acquiring food, or animal population control. These differences of belief may be sincerely held. Whether or not a person chooses to hunt is a personal choice dictated by one's personal ethics. Conflicts arise, however, when a person motivated by one set of ethics tries to force his or her ethics on others through activities such as arguments, harassment, or legislative action.

It is the major purpose of this activity to provide students with an opportunity to come to their own judgements about what they think are the most responsible and appropriate actions to take in situations affecting protected wildlife. The activity will also help them gain a better understanding and respect for other points of view.

Rare Plants & Animals
of the
Hill Country

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TEXAS PARKS AND WILDLIFE

PWD BK W7000-335 (3/98)

WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE

MATERIALS
copies of "dilemma cards"

PROCEDURE
1. From the attached pages, the teacher should copy and cut up the dilemma cards. Students could also be involved in creating the dilemma cards, with each student responsible for one card. Dilemmas can be left entirely open-ended, with no options suggested for consideration.

2. Divide the class into groups of four and give each group a stack of dilemma cards. Place them face down in the center of the group.

3. The first student draws a card from the top of the stack. The student studies the situation, decides what he or she would do, and formulates his or her reasons.

4. When the student is ready (typically less than two minutes), he/she reads the situation and the options aloud to the rest of the group. The student gives the decision he or she and chosen and describes the reasoning involved. In turn, each of the other members of the group is invited to comment on the dilemma and what he or she would do in the situation. The discussion of each dilemma by the members of the group should take about five minutes. The person whose dilemma is being discussed should have the opportunity to ask questions of the other members of the group and to offer clarification about his or her decision. The discussion gives the students experience in having ideas examined by peers and is intended to remind the students of the need to take personal responsibility for decision-making. It is not necessary and may not be desirable for the students to reach consensus; there are legitimately ranging views of the most appropriate and responsible actions to take in many situations. The purpose is to provide students with an opportunity to examine, express, clarify and take responsibility for their own reasoning.

5. The card is then returned to the bottom of the stack and the next student selects a card from the top of the stack. Continue this process until all students have had the opportunity to express their decision and rationale about a dilemma.

EVALUATION
Choose a dilemma. Write a short paragraph on the positive and negative effects of all the options listed for that dilemma. Indicate what additional information, if any, is needed in order to make a responsible and informed decision. Give two opposing and convincing arguments for how to respond to this dilemma. Identify what you judge to be the most responsible decision; explain your reasoning. Explain how someone else could reach a different, yet valid, opinion with the same information.

WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE
DILEMMA CARDS

You have purchased a beautiful ten-acre property near a large lake to build a summer home. One hillside of the property has a lovely view of the lake and is your choice for your homesite. However, you discover there is an active bald eagle nest site on that hillside. The bald eagle is sensitive to disturbance around its nest tree and is a protected species. Bald eagles are highly selective in choosing nest sites and usually return to the same nest year after year. Should you:

* select a different site on the property to build your home;
* sell the property;
* chop down the tree and build your home;
* other

You are out in the woods with a friend when you spot a hawk perched on a high limb. Before you realize what is happening, your friend shoots the hawk. An hour later, you are leaving the woods and are approached by a Texas game warden who tells you a hawk has been illegally shot and asks if you know anything about it. Should you:

* deny any knowledge of the incident;
* admit your friend did it;
* make up a story implicating someone else;
* say nothing, but call the game warden later with an anonymous phone tip;
* other

You have found a young screech owl which you have managed to raise to maturity. You have been told that you cannot keep the owl any longer because keeping it without the proper permit is in violation of state and federal laws. Should you:

* offer it to your local zoo or nature center;
* keep it as a pet;
* call Texas Parks and Wildlife and ask their advice;
* determine if it could survive in the wild and, if it appears it could, release it in a suitable area;
* other

You own a small ranch in the Texas Hill Country. On your ranch is a beautiful canyon with a dense woodland of juniper (cedar) and hardwood trees. You have been told by a local biologist that this type of woodland provides habitat for the endangered golden-cheeked warbler, a colorful migratory songbird that nests only in central Texas. A local man wants to cut some of the larger trees on your ranch for lumber and fence posts and has offered you a good price. You need the money but are concerned about damaging the habitat of an endangered species. Should you:

* let him cut what he wants and get the best price;
* call the local biologist with Texas Parks and Wildlife for advice;
* agree on a lower price and let him selectively cut only a few trees that will not affect the use of the habitat by golden-cheeked warblers;
* tell him you are not interested, you like the woodland just like it is;
* other

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WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE
DILEMMA CARDS

You have discovered a beautiful but rare cactus on your property. After looking it up in several books, you realize that it is a protected plant. From a neighbor, you learn about a local man who buys cactus from landowners, raises them in his backyard nursery, and sells them in the nursery trade. You have been told he will pay you well for the chance to remove wild cactus from your ranch. Should you:

* call him up and offer to let him look for cacti on your land;
* tell no one about your find, choosing to protect your land and the plants on it from trespassers;
* call the local game warden and report your suspicions about the man selling protected plants;
* dig the plants up yourself and take them to a local nursery for sale;
* other

Your family owns a ranch in the lower Rio Grande Valley of south Texas. On your ranch is an area, about 100 acres in size, of very dense, low, thorny brush. The area of dense brush is located near a creek and between the fencelines of two neighboring large ranches. Your father is planning to clear the brush to farm it since the soil is very fertile. After attending a seminar on wildlife, you learn that this type of dense low brush is ideal habitat for the ocelot, an endangered wild cat. You also know that your 100 acres is strategically located between two larger areas of habitat and is probably important as a travel corridor for the cats. Should you:

* ask your father to consider altering his plans by clearing most of the area, but leaving a narrow strip of brush along the creek;
* convince your father to leave the area as it is, providing habitat for this elusive cat;
* contact The Nature Conservancy of Texas and ask them to talk to your family about selling the land to an organization that will manage it as a wildlife preserve;
* say nothing and let your father clear the land and farm it as planned, after all, you want to inherit valuable farmland not worthless brush;
* other

You are goose hunting with a friend. You see two large, white birds flying high overhead. You are pretty sure they are white geese, but something about the way they fly bothers you. You know that endangered whooping cranes sometimes migrate through this area, but are not usually seen this early in the season. Should you:

* shoot and hope your identification is correct;
* wait for another shot, until you are sure of your identification;
* quickly ask you friend for his opinion;
* other

You find a cave on your uncle's land. Many years ago, your family and others before you dumped trash, fluids, and other wastes into the cave. Recently in school, you studied the Edwards Aquifer and how porous limestone rock and underground caves often connect directly to aquifer ground water. You also learned about endangered invertebrate animals that live in caves in your region. You are worried that the dumping over the years has polluted the groundwater and destroyed habitat for these unique cave animals. Should you:

* talk to your uncle about your concerns;
* begin cleaning up the cave on your own, telling no one about your activities;
* report your concerns and the location of the cave to state authorities through an anonymous phone tip;
* with you uncle's permission, enlist the help of your friends to clean up the area around the cave;
*Other

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WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE
DILEMMA CARDS

While squirrel hunting in east Texas, you accidently shoot a woodpecker. Being curious, you take the bird home to identify it using a field guide to the birds of Texas. To your surprise, you identify the bird as the endangered red-cockaded woodpecker. Should you:

* bury the bird in the back yard and tell no one;
* tell your parents what happened and ask their advice;
* call the game warden and tell him the truth;
* leave an anonymous tip on the game warden's answering machine, explaining how you saw someone else shoot the woodpecker;
* other

A number of pet house cats have disappeared from a neighborhood and their owners are upset. They have been told that a great-horned owl lives in a nearby group of trees and has been eating the cats. Many of the neighbors are angry and want to get rid of the owl. Should you:

* place poison meat baits out to try to kill the owl;
* call the local animal control agency (dog catcher) and tell them they should capture the owl and get rid of it;
* allow the owl to remain in the area because it belongs there, believing people should take better care of their pets;
* other

You are an influential member of your ranching community. You have been a good steward of the land for many years and have done a good job of managing the wildlife on your property. You have been very successful in managing for high quality white-tailed deer and have developed excellent habitat conditions. As a result of your management for deer, you have also created excellent habitat conditions for black-capped vireo, an endangered songbird that nests on rangeland with low-growing shrubs in central Texas. A recent trip over the ranch with the local biologist that you work with confirms that black-capped vireos are nesting on your land. Should you:

* make it clear to the biologist that you want no one to know about the birds;
* plan a field day to show your neighbors the wildlife management successes you have had, including the fact that you are proud to be providing habitat for a rare species;
* alter the habitat in the area where the birds are nesting to get rid of them;
* other

You are a landowner and an oil company has found oil on your land. The well is producing several barrels of oil per day, and your income is quite substantial. One day you discover that the well is not cased properly and it is leaking into a nearby spring-fed stream. A rare salamander has been identified in the waters near the springs. You contact the oil company and they refuse to do anything about the leak. You are concerned about the environment and do not wish to contribute to water pollution or destroying habitat for the rare salamanders. Do you:

* keep quiet, say nothing, and let the money roll in;
* try to stop the leak yourself;
* notify the Environmental Protection Agency (EPA);
* threaten the oil company owners with a lawsuit if they do not correct the problem;
* other

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WHAT WOULD YOU DO?
DECISIONS AFFECTING PROTECTED WILDLIFE
DILEMMA CARDS

You are walking in a beautiful open pine woods in east Texas when you spot a brown snake with black markings. You know a man who will pay good money for nice snake skins for use in making belts and hat bands. Curious, you look it up in your field guide and find that it could be the rare Louisiana pine snake, a species listed as threatened in Texas. You don't want to kill a protected species, but you could be wrong about the identification, and it is a very handsome specimen. Should you:

* leave it alone since there is a good chance it is a Louisiana pine snake and therefore protected by state law;
* capture it and take it to the game warden's office so he can make a positive identification;
* assume that it is not a Louisiana pine snake, kill it, and remove the skin for sale

You are visiting with your friends on the street where you live. The neighbor across the street is changing the oil in his car. You watch as he drains the old motor oil into a container and dumps it out at the curb in front of his house. You know that dumping oil into the storm drains can pollute the aquifer and the water that you and your family drink. Should you:

* mind your own business and say nothing to anyone,
* tell your parents what you saw,
* discuss it with your friends,
* walk over to the neighbor and explain your concerns about how dumping motor oil can harm the environment

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Suggested for Grades 6-8

THE TEXAS HILL COUNTRY - CREATIONS IN ART

OBJECTIVES

Students will be able to: 1) learn about the natural history of the Hill Country by researching natural history topics for the mural, 2) understand the connections between the living and nonliving components of the environment, 3) express their knowledge and creativity through art.

SUBJECT AREAS

Science, Art, Language Arts

METHOD

Students research the plants, animals, and nonliving components that make the Hill Country a unique area of Texas. They create a mural or bulletin board depicting the unique natural resources of the Hill Country. Teachers may wish to conduct this activity as an interdisciplinary class project for students in science and art.

BACKGROUND AND PROCEDURES

There are a variety of materials included in this packet that students can use to learn about the diversity of plants, animals, geology, and unique beauty of the Hill Country. You may also provide books from the school library or let students use the internet to research the topics of interest to them. The Texas Parks and Wildlife Department home page has a variety of information that can help them learn about this region of the state (www.tpwd.state.tx.us). Once students have had the opportunity to do individual or group investigations of the topic (one or two class periods), let them design the mural. As a class you may want to discuss the major topics that you want the mural to address; i.e. certain plants, animals, geology, water. After the class has decided on the overall design of the mural, you might want to assign a part of the space to each group so that everyone has the chance to participate. Challenge the students to create an artistic depiction of the Hill Country ecosystem in a way that informs others about its unique natural resources.

MATERIALS

- background materials for researching the topic
- a large space and paper
- art supplies such as crayons, chalk, markers, paints, colored paper

EVALUATION

Have the students write an essay about the most important things they learned about the Texas Hill Country. Encourage them to write about the topics that impressed them the most. Ask them to discuss some positive actions they could personally take to conserve the natural resources of the Hill Country.

EXTENSION

Have the students create their own dioramas depicting some aspect of the rare and unique natural resources found in the Texas Hill Country. Students could work individually or in groups for this activity. Materials needed include small boxes or flat cardboard bases for mounting the diorama, along with paper and art supplies for creating it.

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TEXAS PARKS AND WILDLIFE

PWD BK W7000-335 (3/98)

Suggested for Grades 6-8, with extensions to Grade 12

USING TOPOGRAPHIC MAPS TO STUDY WILDLIFE

OBJECTIVES
Students will be able to: 1) Determine slope and geographic features using a topographic map, 2) understand how biologists use topographic maps to study wildlife, 3) delineate potential golden-cheeked warber habitat on the topographic map. It is desirable for students to have had some introduction to the use and purpose of topographic maps prior to beginning this activity.

SUBJECT AREAS
Science, Math

SKILLS
Map skills; determining slope; compiling, analyzing, and presenting data.

METHODS
Students learn to read a topographic map and practice using their map skills to delineate habitat and record data. Students practice using topographic maps similarly to the way biologists use them in wildlife research.

BACKGROUND
Topographic maps use contour lines to show elevation (height above sea level). Contour lines join points of equal elevation above a secified reference, such as sea level. Ask students to think of a contour line as an imaginary line on the ground that takes any path necessary to maintain constant elevation. Topographic maps are used for many purposes by many types of people. Hikers use them to explore the outdoors, engineers use them to construct roads and buildings, and biologists use them to study wildlife.

In central Texas, biologists use topographic maps as a tool to help them locate areas of habitat and to record information about the biology of the endangered golden-cheeked warbler, a migratory songbird that nests in central Texas and winters in Mexico. Golden-cheeked warblers nest in woodlands with large juniper, oaks, and other hardwood trees. Some of the best habitat for these songbirds is found in association with steep slopes and wooded canyons. Wildlife biologists studying the golden-cheeked warber use topographic maps to help them determine where to look for nesting warblers. They also use them to record nest territories. A nest territory is an area around the nest site where the male golden-cheeked warbler chases all other males of his species away. He defends it against intruders. It is useful to know the number of territories to get some idea of how many golden-cheeked warbler pairs are nesting in a particular area of habitat.

SUGGESTED PROCEDURES
Present the background information on habitat requirements of the golden-cheeked warbler to the students. Ask them to imagine that they are wildlife biologists studying the golden-cheeked warbler. Students can work individually or in teams to complete the following exercises using the attached replica of a topographic map.

1. The presence of water often indicates lush woodlands that produce lots of insects, which golden-cheeked warbers eat and feed to their young. Using a blue pencil or pen, trace the watercourses indicated on the map.

2. In studying wildlife, it is often necessary to know something about adjacent land uses to better understand how animals use suitable habitats. Traffic from roads, urban development, noise and general disturbances by humans and their pets can be factors affecting nest success. Using a black pen, circle the roads and human development that might affect the nesting success of the birds you are studying.

3. As a biologist studying the nesting behavior of golden-cheeked warblers, you want to locate nests so you can observe the birds. Indicate on the map which areas you would choose to search that, in your opinion, would give you the greatest chance of finding golden-cheeked warbler nests. Circle the areas using a red pencil and be able to explain why you chose these areas.

4. Determine the percent slope at the nest near Horned Lizard Hill. What is the percent slope on the ridgetop upslope from the nest? Percent slope is determined by the formula rise/run. Example - Using the topographic map, you can determine that a slope rises 10 feet over a linear distance of 100 feet. The slope of the hill at that point is 0.1 or 10 percent.

5. Fledglings, young birds just out of the nest, are often seen feeding in more open woodlands on flatter slopes. Using a pencil, circle the areas on the map with flatter slopes adjacent to the canyons where warblers are likely to nest.

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USING TOPOGRAPHIC MAPS TO STUDY WILDLIFE

EVALUATION

Show the students a real topographic map and ask them to indicate the areas of steep and gentle slopes. Have them point out various landforms; such as creeks, hilltops, ridges, wooded areas, lakes or ponds, roads, wells, gravel pits, and other features. You can purchase topographic maps from the USGS by calling 1-800-HELP-MAP. The USGS also has a nice web page with information for educators and students. The address is www.usgs.gov.

EXTENSIONS FOR GRADES 9-12

To understand more about the type of nest sites preferred by golden-cheeked warblers, biologists mark the locations of individual birds on a map. To tell the birds apart, and identify individuals, biologists capture the birds using mist nets and place colored bands on their legs. They also place a U.S. Fish and Wildlife Service silver band on each bird. The number on the silver band and data recorded by biologists for that individual bird is entered into a central database so biologists can learn more about migration patterns, distribution, and dispersal (where the young go when they leave the nest). The sequence of how the silver and color bands are placed on either the left or right leg enables biologists to identify individuals in the field without recapturing them. When color-banded birds are observed in the field, biologists mark the locations of these birds using a base map, usually either a topographic map or an aerial photograph. Once the locations are recorded, biologists are able to understand more about the use of the habitat by individual nesting pairs within a territory. A territory is the area around the nest defended by the male against intrusion by other golden-cheeked warbler males. Use the following field data to record the locations of golden-cheeked warblers identified on your study area. Use the topographic map supplement to mark your locations.

Note to Teachers: Students can use protractors to accurately measure directions on the map. If protractors are not available, students can estimate the degree readings to the nearest 45 degrees.

Note to Students: The old rock chimney is all that remains of the Old Pioneer's Homestead.

Sighting 1 - male, siver/left leg, violet/right leg: from old chimney, 1800 ft. at 225 degrees

Sighting 2 - female, green/left leg, silver/right leg: from old chimney, 700 ft. at 305 degrees

Sighting 3 - male, siver/left leg, violet/right leg: from old chimney, 600 ft. at 215 degrees

Sighting 4 - male, silver/left leg, violet/right leg: from sighting 1, 800 ft. at 105 degrees

Sighting 5 - female, green/left leg, silver/right leg: from old chimney, 700 ft. at 30 degrees

Sighting 6 - male, pink/left leg, silver/right leg: from old chimney, 2000 ft. at 305 degrees

Sighting 7 - male, pink/left leg, silver/right leg: from old chimney, 1400 ft. at 335 degrees

Sighting 8 - female, green/left leg, silver/right leg: from concrete cistern, 3000 ft. at 310 degrees

Sighting 9 - male, blue/left leg, silver/right leg: from concrete cistern, 1600 ft. at 245 degrees

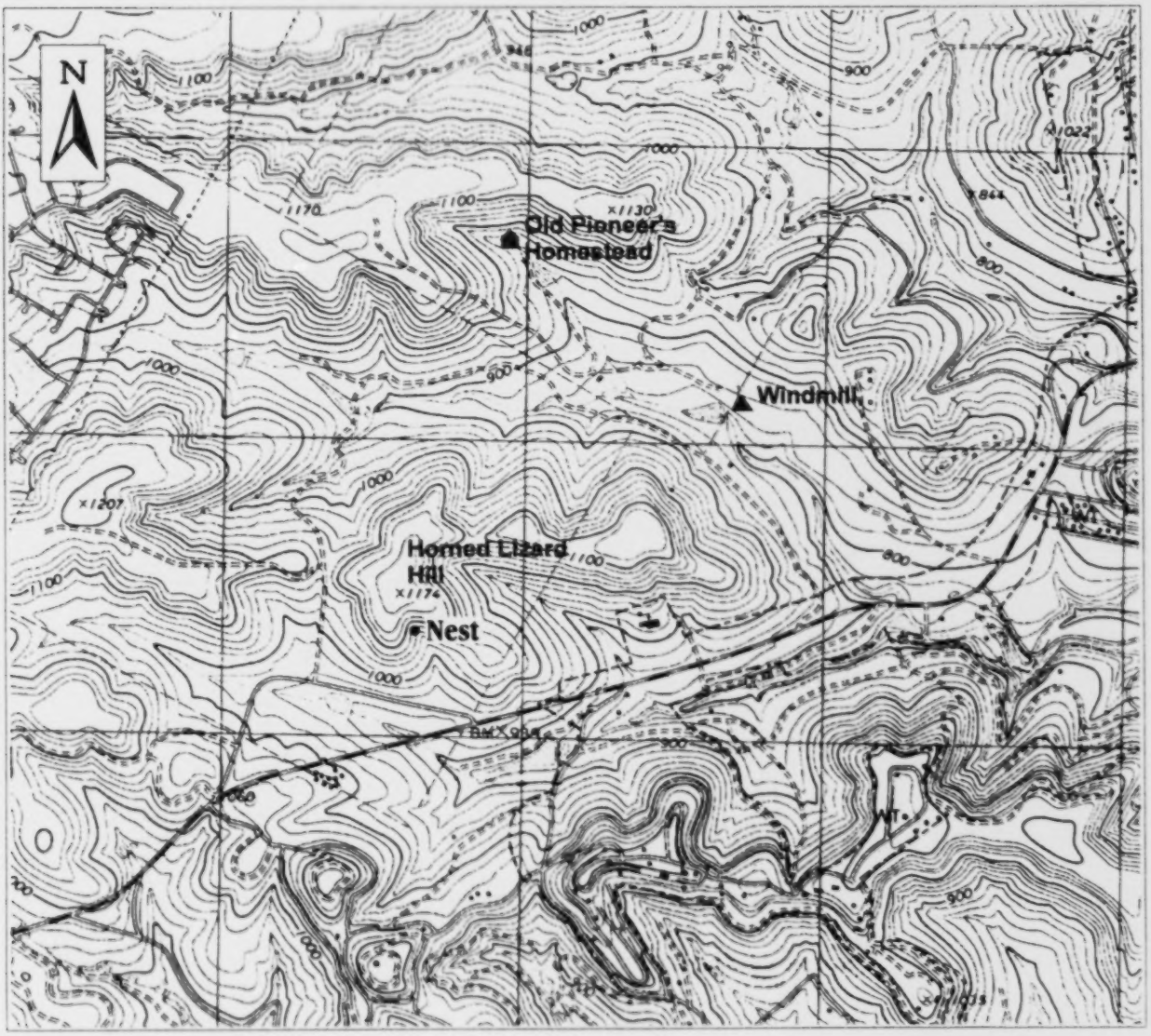
Sighting 10 - male, blue/left leg, silver/right leg: from concrete cistern, 2200 ft. at 240 degrees

Sighting 11 - male, blue/left leg, silver/right leg: from sighting 8, 2400 ft. at 190 degrees

Sighting 12 - male, pink/left leg, silver/right leg: from sighting 7, 1000 ft. at 335 degrees

USING TOPOGRAPHIC MAPS TO STUDY WILDLIFE

Student Worksheet



SCALE 1 INCH = 2000 FEET

0 1000' 2000'

CONTOUR INTERVAL = 20 FEET

MAP LEGEND

- Creek
- Pond or Lake
- Dirt road
- Paved road
- Highway
- Church
- House
- Power lines
- Fencelines

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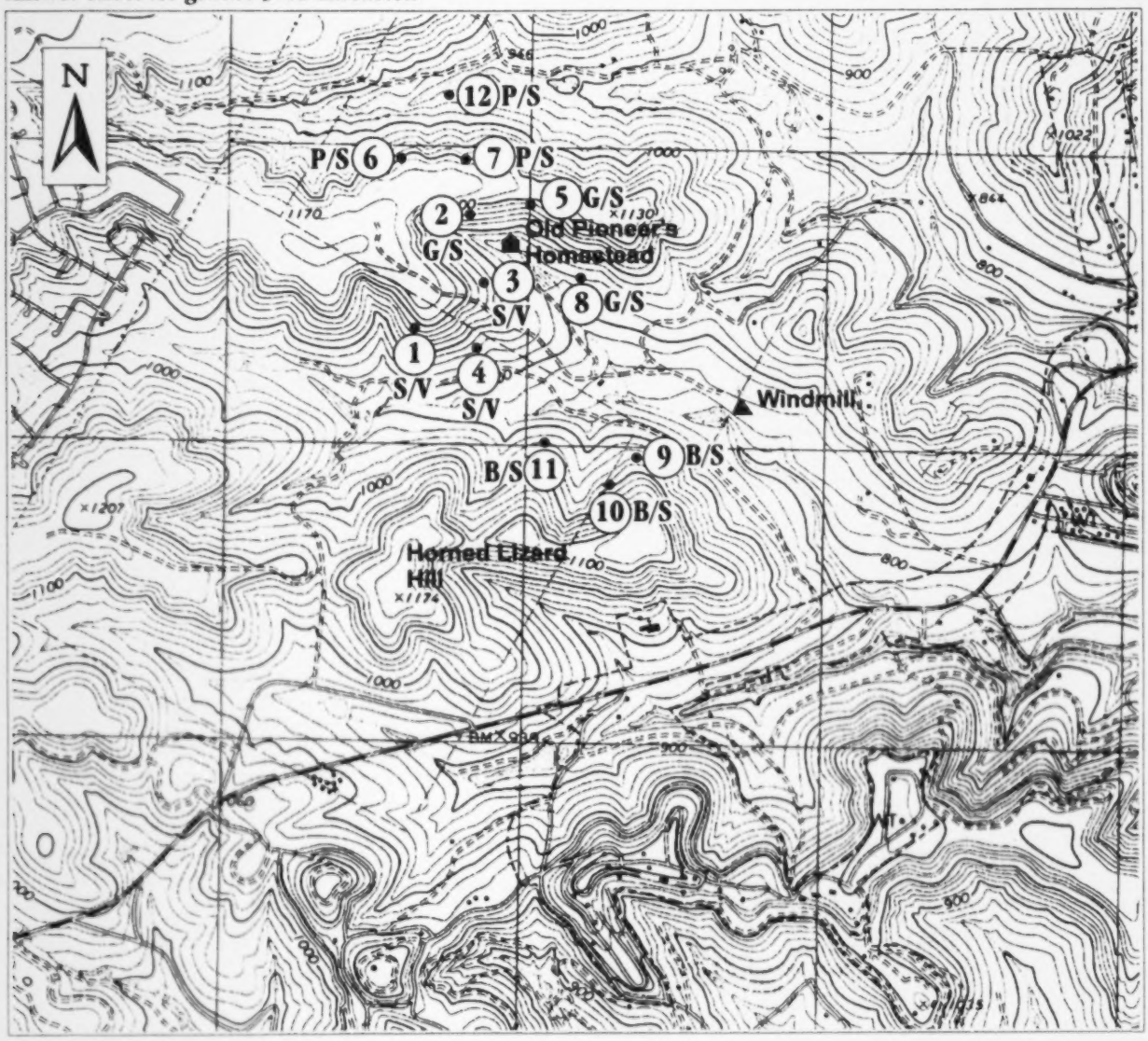
USING TOPOGRAPHIC MAPS TO STUDY WILDLIFE
Topographic Map Supplement

Teacher Page

Answer sheet for grades 9-12 Extension



SCALE: 1 INCH = 2000 FEET

0 1000' 2000'

CONTOUR INTERVAL = 20 FEET

MAP LEGEND

- Creek
- Pond or Lake
- Dirt road
- Paved road
- Highway
- Church
- House
- Power lines
- Fencelines

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Suggested for Grades 9-11

EXPLORING CONSERVATION OF RARE SPECIES IN THE HILL COUNTRY
A RESEARCH PROJECT

OBJECTIVES
Students will be able to: 1) Conduct a literature search concerning topics dealing with conservation of rare resources in the Hill Country, 2) Compile and analyze information to produce a written report on their chosen topic, 3) Make an oral presention to the class concerning highlights of their report.

SUBJECT AREAS
Science, Language Arts

SKILLS
Compiling and analyzing information, Report writing, Oral presentation

METHODS
Students research the topics of their choice concerning conservation of rare species in the Hill Country of central Texas. They prepare a written report about their chosen topic and share the information with the rest of the class in an oral presentation.

BACKGROUND AND SUGGESTED PROCEDURES
Allow a pre-determined amount of time to complete the research and written report. Teachers may wish to give examples of appropriate topics, or allow students considerable freedom in choosing topics of interest to them. As general guidance, topics should address issues relating to the conservation of rare species found in central Texas. At a minimum, reports should include: 1) a description of the species, 2) description of historical and present range in Texas, 3) description of habitat, 4) reasons for decline or conservation concern, 5) what is being done to conserve the species, 6) outlook for the future, 7) other noteworthy items concerning how people affect the decline or recovery of the species. Provide students with the attached list of references to get them started with their research.

SUGGESTED EVALUATION TECHNIQUES
1. Depth of research, use of various sources, ability to compile and synthesize information from a variety of sources.
2. Written report - format, style, sentence structure and grammar, organization, critical analysis of information, insightful presentation.
3. Oral Presentation - clear and well-organized, manner of presentation, knowledge of subject

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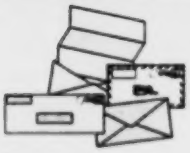
of the
Hill Country

Prepared by
Endangered Resources Branch
TEXAS PARKS AND WILDLIFE

PWD BK W7000-335 (3/98)

RESOURCE LIST



A Resource List for Educators

Educators!

It is our hope that this list of resources will make it easier and more enjoyable for you and your students to learn about wildlife in Texas. Feel free to contact the staff listed below if you have further questions.

TPWD Endangered Resources Branch Personnel

Ann Miller, Outreach Specialist
3000 IH 35 South, Suite 100
Austin, Texas 78704
• (512) 912-7025
ann.miller@tpwd.state.tx.us

Linda Campbell, Regional Biologist
3000 IH 35 South, Suite 100
Austin, Texas 78704
• (512) 912-7044
linda.campbell@tpwd.state.tx.us

Kevin Mote, Regional Biologist
P.O. Box 659
Canyon, TX 79015
• (806) 655-3782

Lee Elliott, Regional Biologist
TAMUCC Natural Resources Center, Suite 2501
6300 Ocean Dr.
Corpus Christi, TX. 78412
• (512) 980-3246
lee.elliott@tpwd.state.tx.us

Ricky Maxey, Regional Biologist
P.O. Box 4655
SFA Station
Nacogdoches, TX 75962
• (409) 564-7145
rmaxey@sfasu.edu

Internet Resources:

Texas Parks and Wildlife – http://www.tpwd.state.tx.us
U.S. Fish and Wildlife Service – http://www.fws.gov
National Wildlife Federation – http://www.nwf.org/nwf/
World Wildlife Fund – http://www.wwf.org
The Nature Conservancy – http://www.tnc.org
California Environmental Resources Evaluation System – http://ceres.ca.gov
National Geographic – http://nationalgeographic.com
National Gardening Association – http://www.garden.org/edu
National Consortium for Environmental Education and Training – http://www.nceet.snre.umich.edu

Agencies and Organizations Resources:

Texas Parks and Wildlife Department
Endangered Resources Branch
3000 IH 35 South, Suite 100
Austin, TX 78704
• (512) 912-7011
Posters, books, videos, classroom activities, and other publications about Texas endangered and threatened species. "Rare Texas Wildlife" Educational Trunk available to educators by contacting Endangered Resources Branch staff at left.

Texas Parks and Wildlife Department
4200 Smith School Rd.
Austin, TX 78744-3291
• 1-800-792-1112
Various educational programs such as Project WILD, Exploring Texas, Wildscapes, Hunter Education, Boater Education, Angler Education, various programs at state parks and state natural areas as well as written and visual materials dealing with Texas wildlife, habitat, and wildlife issues.

BEST COPY AVAILABLE

Rare Plants & Animals
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Sportsman Conservationists of Texas
807 Brazos, Suite 311
Austin, TX 78701
Educational publications on predators, frontiers, endangered species, and pollution

The National Geographic Society
Geography Education Program
P.O. Box 37138
Washington, DC 20013-7138
- (202) 775-6701
- 1-800-924-6738 (Video ordering)

Award-winning videos about wildlife and wildlife issues. See "Don't Say Goodbye" about endangered species in the United States.

Texas Dept. Of Transportation
125 E. 11th St.
Austin, TX 78701-2483
- (512) 463-8585

Publications on a wide variety of environmental topics for Texas

Texas Dept. of Agriculture
P.O. Box 1284, Capitol Station
Austin, TX 78711
- (512) 463-7476

Publications on horticulture, agriculture, pesticides, and endangered species

National Wildflower Research Center
4801 LaCrosse Ave.
Austin, TX 78739
- (512) 292-4100

Curricula, posters, books, and other resources dealing with native plants

Center for Plant Conservation
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166
Curricula for middle school; resource guide; other publications

World Resources Institute Publications
P.O. Box 4852
Hampden Station
Baltimore, MD 21211
Eleven different curriculum packages dealing with resource issues for the secondary level

National Gardening Association, Dept. MP
180 Flynn Ave.
Burlington, VT 05401
- 1-800-538-7476

Newsletter, Growing Ideas: A Journal of Garden-Based Learning has classroom-tested project ideas and experiments. Also supports on-line classroom exchange of gardening experiences, teaching strategies, grant information, etc.

Texas Natural Resources Conservation Commission
12100 Park 35 Circle
Austin, TX 78753
- (512) 239-1000

U.S. Fish and Wildlife Service
National Conservation Training Center
Route 1, Box 166
Shepherds Town, WV 25443
- (703) 358-2171

Videos, brochures, and "Wildlife Biologue Series"

Endangered Species Protection Program (H7506C)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
Endangered species coloring book

Defenders of Wildlife
1101 14th St., NW
Washington, DC 22005
CD-ROM - "Wildlife Forever" plus educator's guide and classroom activities for grades 3-6. Many written materials available upon request.

HEART (Help Endangered Animals-Ridley Turtle)
P.O. Box 681231
Houston, TX 77268-1231
- (281) 444-6204

Video and curriculum guide, posters, monthly newsletter, membership

Horned Lizard Conservation Society
P.O. Box 122
Austin, TX 78767
Publications, slide presentation, and activity guide for elementary age students about the Texas Horned Lizard

Texas Audubon Society
2525 Wallingwood, Suite 301
Austin, TX 78746
- (512) 306-0225

Publications, programs, speakers for various age groups available through local chapters. Call to get local resource numbers.

National Wildlife Federation
1400 Sixteenth Street, NW
Washington, DC 20036-2266
- (800) 822-9919

South Central Office:
4505 Spicewood Springs Rd.
Austin, TX 78759
- (512) 346-3934

High quality videos and magazines for both adult and student audiences and yearly curricula packets for teachers.

Bat Conservation International
PO Box 162603
Austin, TX 78716-2603
High quality videos, posters, and educational publications about bats.

World Wildlife Fund
1250 24th St., NW
Washington, DC 20037-1175
High quality educational materials including videos, curricula kits, and posters on biodiversity, endangered species, and rainforests.

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